Swiss Doctoral Program in Mathematics

Universities of Basel, Bern, Fribourg, Geneva, and Neuchâtel

Welcome

Under the label **Swiss Doctoral Program in Mathematics** the departments and institutes of mathematics at the Universities of Basel, Bern, Fribourg, Geneva and Neuchâtel offer a joint program for doctoral students in mathematics. The program is open to all doctoral students at the mentioned universities and aims to provide a comprehensive spectrum of research and training activities.

By completing the *Swiss Doctoral Program in Mathematics* doctoral students will be provided, in addition to the doctoral degree from the participating university, with a **certificate** of the *Doctoral Program*.

The graduate students are attached to the universities where they are enrolled. In particular, master's and doctoral degrees are issued by the participating universities and are outside the competence of the *Doctoral Program*.

The *Swiss Doctoral Program in Mathematics* consists of participating faculty, graduate students enrolled in the *Doctoral Program*, and post-docs. Participation is voluntary. The *Doctoral Program* permits doctoral students to validate their engagement, which is not possible without the framework of this program.

In a pilot phase during the academic year 2006/07, the *Swiss Doctoral Program in Mathematics* runs together with the pre-existing *Ecole doctorale de mathématiques Genève - Neuchâtel*.

Objectives

The aim of the *Swiss Doctoral Program in Mathematics* is to offer an advanced research training in mathematics of high quality and to prepare doctoral students for their future career.

The *Doctoral Program* provides a broad platform for contacts among the mathematical research groups in Switzerland. The synergistic effect initiated by the joint activities represents a major added value complementing the research activities of the participating universities.

The *Swiss Doctoral Program in Mathematics* covers the three following parts:

Education: In a joint effort of the participating research groups at the departments of mathematics at the involved universities the *Doctoral Program* offers an intensive and broad graduate education in mathematics of international format. The program consists of a wide range of graduate courses and research seminars and is complemented by the program of the *Troisième Cycle Romand de Mathématiques*. Moreover, special programs are launched that include block-courses given by internationally recognized speakers, and sequences of lectures focusing on recent developments. The program comprises both, activities that provide a good general mathematical background and specialized topics which are related to the research interests of groups of doctoral students.

Information: The *Doctoral Program* offers a platform of information about research activities, conferences, the mathematical community, and exchange programs. It also provides information about job opportunities and continuing education.

Career management: The *Doctoral Program* addresses the issue of the professional integration of doctoral students. It serves as a platform to establish contacts with doctoral students of other research groups in Switzerland and offers a challenging and stimulating atmosphere so as to provide young researchers with an excellent base for a professional or research career in mathematics.

Neighboring Schools

The *Swiss Doctoral Program in Mathematics* collaborates with

- The Zurich Graduate School in Mathematics
- Ecole doctoral de l'EPFL
- Le 3e Cycle romand de Mathématiques
- The Graduate Program in mathematics of Bern and Fribourg

Reciprocity agreement between the Zurich Graduate School in Mathematics and the Swiss Doctoral Program in Mathematics: PhD Students which are enrolled in either school are entitled to participate in activities of the other school. A request for reimbursement of travel or other costs can only be filed with the own school according to its rules.

Spectrum of Activities

The *Doctoral Program*

- offers courses in all areas of mathematics at graduate and research level,
- organizes workshops and block-courses in which experts present advanced topics and work with the doctoral students,
- organizes workshops and seminars where the doctoral students present in an accessible way the context and the progress of their own research in a talk or by a poster,
- encourages doctoral students to participate actively in international conferences,
- proposes complementary training in scientific English, computer science, scientific writing and presentation technique,
- prepares and stimulates the transition of the doctoral students to the professional life in industry, administration or in academia,
- sets up a network of information relevant to doctoral students for succeeding in their thesis and in their career planning.

Activities of the *Doctoral Program* include the following events primarily targeted at the graduate student audience:

- **Graduate courses:** in general, these are special courses at the graduate level given over the period of one semester, or more concentrated courses having around 20 teaching hours. Graduate courses have a flexible format: they can be given by one or several teachers, and they can be offered once a week or they can be organized in intensive modules dispatched over one-week periods.
- **Summer/Winter Programs:** these are one-week events which bring together graduate students and leading experts in their respective fields. Typically, the invited speakers present several mini-courses, and there is a possibility for informal discussions with graduate students.
- **Graduate Colloquium:** this is an opportunity for graduate students to present their own work in front of a friendly audience. Such events can be organized in particular topics, as well as at the interdisciplinary level (between different fields of mathematics).
- **Other Events** can be organized at the request of the members of the *Doctoral Program*, if the committee finds them suitable.

Every year, the *Doctoral Program* organizes a list of events where doctoral students are encouraged to participate and to earn credits. Each event is assigned a certain number of credits depending on its length and content.

Below we list more particular targets of the *Doctoral Program* which are not currently covered by the *3e Cycle Romand*:

- To offer a choice of advanced graduate courses in various fields of mathematics (similar to American graduate schools). These courses will be addressed to graduate students in the beginning of their studies. The main purpose is to provide an up to date background in the major fields of mathematics to the graduate students participating in the *Doctoral Program*.
- To organize two-day meetings within the Graduate Colloquium. These meetings will give an opportunity to doctoral students to present their research area to other doctoral students and their results to experts in the respective fields.
- To organize Summer/Winter Schools in case the offer of such schools is not sufficient. The topic can vary and it will be chosen according to the research topics of graduate students participating in the *Doctoral Program*.

On a smaller scale, the *Doctoral Program* addresses the issues of marketing of scientific research and of the professional integration of doctoral students. In particular, the following issues should be touched upon in the format of lectures or workshops:

- How to write articles in mathematics (what is an introduction, how to compose the bibliography etc.)?
- How to make a presentation (in particular, in English)?
- How to use a computer in mathematical research?
- How to write a CV, and how to prepare a job interview?

Responsibilities of the Committee

The activities of the *Doctoral Program* are planned and directed by the *Doctoral Program Committee* composed of **two faculty members** and **one graduate student (and a substitute)** from **each university participating** in the *Doctoral Program*. The Director of the *3e Cycle Romand de Mathématiques* is a permanent invitee in the *Committee*. The responsibilities of the *Committee* are as follows:

- To plan activities of the *Doctoral Program* and to coordinate the activities with other graduate schools. The program of activities is prepared and announced for each academic year.
- To distribute the budget of the *Doctoral Program* between different activities.
- To approve applications of graduate students for entering the *Doctoral Program* and for participation in various activities.
- To assign credits to graduate students for successful participation in the activities of the *Doctoral Program* or in other activities in mathematics at the graduate level.

Faculty members of participating institutions are entitled and invited to submit proposals to the *Doctoral Program Committee*.

The *Committee* nominates the **Director(s)** of the *Doctoral Program*. The *Director* is a faculty member at one of the participating universities. The *Committee* can delegate part of its responsibilities to the *Director* who runs the activities of the *Doctoral Program* in the periods between the meetings of the *Committee*.

Directors

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* Directors of the *Doctoral Program*
** Director of the *3e Cycle Romand de Mathématiques* (permanent invitee)

Junior Committee Memebers

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Enrollment: General

The participation in the *Doctoral Program* is voluntary for both, faculty and doctoral students. However it is recommended. All doctoral students of the participating universities and all faculty members and post-docs have access to the activities of the *Doctoral Program* and are invited to participate actively. Enrolled doctoral students are entitled to apply for **refund of costs** for the successful participation in activities of the *Doctoral Program*.

Enrollment of a doctoral student in the *Doctoral Program* ends with the conferral of the doctorate and is limited to five years. Participating doctoral students are usually employed as assistants at one of the affiliated universities or hold a scholarship of the National Science Foundation or of other sources.

Scoring

The participation of a doctoral student in the *Doctoral Program* is validated by ECTS points. A doctoral student must acquire a minimum of **30 ECTS points** to be entitled to receive the certificate of the *Doctoral Program*. A doctoral student can earn credit points as follows:

1. By following and validating a course which is approved by the *Doctoral Program* (3 ECTS points)
2. By participating and validating a workshop, block-course or conference approved by the *Doctoral Program* (3 ECTS points)
3. By presenting the context and the progress of the own research within the framework of a colloquium (3 ECTS points)
4. By presenting a scientific topic different from the own research within the framework of a colloquium (3 ECTS points)
5. By participating in a complementary training in scientific English, computer science, scientific writing or presentation technique, or by organizing a scientific activity within the framework of the *Doctoral Program* (1 ECTS = 25 hours of work)
6. For a doctoral student working as an assistant, a maximum of 6 ECTS points can be obtained by fulfilling his teaching obligations. This maximum corresponds to the teaching load of a half-time assistant during four years.

A minimum of 9 ECTS points must be acquired in the first category, and at least 6 ECTS points in each of the categories 2 and 3.

Each doctoral student is guided by an advisor, usually a professor of one of the affiliated universities. Of course, *thèses en co-tutelle* and co-direction of a thesis is possible. The doctoral student develops a research activity and is supposed to obtain results that lead to the granting of a doctorate at the respective university.

Validation

Doctoral students who are registered with the *Swiss Doctoral Program in Mathematics* can validate an activity by sending the validation form to

Norbert Hungerbühler
Department of Mathematics
University of Fribourg, Pérolles
CH-1700 Fribourg

Download the validation form.

To earn the credits one needs to satisfy certain criteria, e.g. to pass a test/exam for graduate courses, to give a talk at the Graduate Colloquium, or to take an active part in a Summer/Winter School etc. The *Doctoral Program* accepts credits earned in the activities organized by the *Le 3e Cycle romand de Mathématiques* and by other graduate schools in mathematics.

By sending the form, the ECTS points associated with the activity are credited your account.

Please attach the reimboursement form in case you apply for refund of costs. And please keep a copy of the form with your records.

Reimbursement

Doctoral students who are registered with the *Swiss Doctoral Program in Mathematics* can apply for reimboursment of travel costs connected to the participation and validation of an activity of the *Doctoral Program* by sending the reimbursement form to

Norbert Hungerbühler
Department of Mathematics
University of Fribourg, Pérolles
CH-1700 Fribourg

Download the reimbursement form (only valid if attached to the validation form for the same activity).

Observe that, during the pilot phase 2006/07, doctoral students from Geneva and Neuchátel are refunded by money from the *Triangle Azur*, while students from Basel, Bern and Fribourg are refunded by local sources.

Reporting

The progress of graduate students within the *Doctoral Program* is evaluated each year by the *Doctoral Program Committee* or the *Director* on the basis of the credits obtained by doctoral students. The *Doctoral Program* works in close contact with the thesis advisors of the graduate students. In particular, the progress evaluation is communicated to the thesis advisors.

Doctoral students submit **yearly a report** documenting their activities related to the *Doctoral Program*. They can include a summary of their research results. The report is to be sent at the end of the academic year to

Norbert Hungerbühler
Department of Mathematics
University of Fribourg, Pérolles
CH-1700 Fribourg

Upon conferral of your doctorate please send a notice to the same address with your postal address. You will then receive your **certificate** of the *Doctoral Program*.

Program of the academic year 2006/2007

Intensive course in Riemannian Geometry
Monday, September 11 - Friday, September 29, 2006, Neuchâtel
Bruno Colbois, Patrick Ghanaat and Marc Troyanov, in collaboration with EPFL

Special Course in Differential Geometry
The course will be divided into 2 different parts: the first one will be dedicated to conformal geometry and to an overview of the proof of the Yamabe conjecture; the second one will be about Bochner methods and some applications.
The sessions will occur from 10.00 to 12.00 at Neuchâtel Mathematical Institute, on the following Fridays mornings: • October 27 • November 10 and 24 • December 22 • January 19 • February 2 and 9
The course is given by Daniel Maerten.

Special Course in Stochastic Differential Equations
Benjamin Bergé (Neuchâtel) will give a series of lectures about the subject *Linéarisation d'Equations Différentielles Stochastiques*.
The course starts Tuesday, October 31, 2006, 14.15-15.30, Institute of Mathematics, Neuchâtel, Room E 213.
Contact and information: raphael.rossignol@unine.ch

Graduate Colloquium
Thursday, December 7 - Friday, December 8, 2006, Geneva
Rudolf Rohr, Shaula Fiorelli

Graduate Seminar on Geometry
Winter term 2006/07, Friday, 14:15-17:00, Bern
Andreas Bernig, Bruno Colbois, Ruth Kellerhals

Special Lectures: Graduate Seminar on Geometry
Friday, January 12, 2007
14:15 - 15:15 Burkhard Wilking (Münster) *Manifolds with positive curvature operators are space forms*
16:00 - 17:00 Christoph Boehm (Münster) *Ricci flow and non-negative sectional curvature*
Room B1, Mathematical Institute, University of Bern

Ludwig Schläfli Lecture
Oleg Viro (Uppsala): *A problem on the sixteenth Hilbert problem*
University of Bern, Mathematics Building, Lecture Room B7, 17:15, January 15, 2007

Conference Geometric linearization of graphs and groups
Centre Bernoulli, EPFL, January 22 - 26, 2007

Graduate course
Christof Melcher (HU Berlin): Einführung in die Methoden elliptischer Regularitätstheorie
February 19 - 23, 2007, Basel
Contact and information: Ben Schweizer

Recommended external Activities

- Ecole doctorale de mathématiques Genève - Neuchâtel
- IIIe Cycle romand de Mathématiques
- Zurich Graduate School in Mathematics
- Ecole doctoral de l'EPFL
- Graduate Program in mathematics of Bern and Fribourg

Advanced Courses 2006/07

Specific courses which are held in the framework of a master program are also qualified for PhD students. Such courses can be announced on this page using the usual form and are thereby open for all PhD students participating in the Doctoral Program. In order to minimize travelling, it is recommended to organize such courses in a bi-weekly rhythm or as block courses.

Instructor	Course	University
Norbert Hungerbühler	Weak convergence methods	Fribourg
Christof Melcher	Einführung in die Methoden elliptischer Regularitätstheorie	Basel

Doctoral Student's Page

On this page, all Doctoral Students of the *Doctoral Program* can announce their own talks, presentations, mini-courses etc. To do so, please fill in the corresponding form.

Francois Fillastre (Neuchâtel)
Two talks in the Graduate Seminar on Geometry, Bern 3.11.2006, 14:15 - 15:15: Realisation of metrics on compact surfaces, an overview 3.11.2006, 16:00 - 17:00: Realisation of complete hyperbolic metrics on surfaces
Lecture in the DFG Research Group *Polyhedral Surfaces*, TU Berlin 10.10.2006, 16:15: Realisation of metrics on compact surfaces, an overview
7.12 - 8.12.2006: Poster presentation, Graduate Colloquium of the Swiss Doctoral Program, Geneva

Michael Wiemeler (Fribourg)
Lecture in the Oberseminar Geometry und Topologie, Fribourg 08.11.2006, 10:15: Toruswirkungen auf Homotopie komplex projektiven Räumen

Thierry Hild (Fribourg)
Two lectures in the Graduate Seminar on Geometry, Bern 17.11.2006, 14:15: Volumes of cusped hyperbolic orbifolds I 17.11.2006, 16:00: Volumes of cusped hyperbolic orbifolds II

Vincent Emery (Fribourg)
Lecture in the Oberseminar Geometry und Topologie, Fribourg 6.12.2006, 10:15: Introduction aux réseaux arithmétiques

Philipp Habegger (Basel)
Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 7.12.2006, 11:15: Upper and lower bounds for heights

Christian Wyss (Bern)
Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 7.12.2006, 13:30: An operator Riccati equation

Luc Guyot (Geneva)

Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 7.12.2006, 15:00: Limits of finite groups

Kolawolé Atchadé (Neuchâtel)

Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 8.12.2006, 09:30: Introduction to the stochastic replicator dynamics

Philip Heuser (Basel)

Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 8.12.2006, 11:00: Homogenization of multidimentional structures

Stefan Borell (Bern)

Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 8.12.2006, 13:30: Embeddings into Complex Euclidean Spaces

Nicolas Bartholdi (Geneva)

Lecture at the Graduate Colloquium of the Swiss Doctoral Program, Geneva 8.12.2006, 15:00: The diophantine dimension of the p-adic fields

Math Departments worldwide

Directories with lists of Mathematics Departments

- Luchsinger's Worldwide Department Index
- Google Academic Math Departments
- The Penn State Math Directory
- The Florida State Math Directory

Mathematical Societies

Quick links

- Swiss Mathematical Society
- DMV Deutsche Mathematiker-Vereinigung
- EMS European Mathematical Society
- AMS American Mathematical Society
- IMU International Mathematical Union
- SIAM Society for Industrial and Applied Mathematics
- LMS London Mathematical Society
- GAMM Gesellschaft für Angewandte Mathematik und Mechanik
- ÖMG Österreichische Mathematische Gesellschaft
- UMI Unione Matematica Italiana
- SMF Société Mathématique de France
- SMAI Société de Mathématiques Appliquées
- ICIAM International Council for Industrial and Applied Mathematics
- GMFH/SMHES Gesellschaft für Mathematik an den Schweizer Fachhochschulen

Other directories

- Luchsinger's Worldwide Society Index
- EMS Member Societies
- IMU Member Societies
- ICIAM Member Societies

PhD Students participating in the Doctoral Program

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Christian Wyss	cwyss@math.unibe.ch	Bern

Research Groups

Professor	University	Field
Michel Benaïm	Neuchâtel	Probability
Bruno Colbois	Neuchâtel	Riemannian geometry, metric geometry
Anand Dessai	Fribourg	Geometric topology (Lie group actions on manifolds, elliptic genera, curvature and symmetry)
Norbert Hungerbühler	Fribourg	Nonlinear PDEs, geometric evolution problems, calculus of variations
Ruth Kellerhals	Fribourg	Hyperbolic Geometry, Geometry of Discrete Groups
Hanspeter Kraft	Basel	algebraic transformation groups, representation theory, geometric and computational invariant theory
David Masser	Basel	Number theory (diophantine geometry, diophantine approximation, and transcendental numbers
Alain Valette	Neuchâtel	Analysis on groups (group algebras, harmonic analyis, geometric group theory)

Prizes

On the occasion of the **Graduate Colloquium** of the Swiss Doctoral Program **Birkäuser Publishing House** awards a prize for the best talk and a prize for the best poster.

Date	Prize	Laureate
8.12.2006	Best talk	Philipp Habegger (Basel)
8.12.2006	Best poster	François Fillastre (Neuchâtel)

Jobs and Grants

Current Academic Job Announcements in Switzerland

- University of Bern: 2 year Postdoc position in Geometric Analysis
- University of Fribourg: Senior Assistant in Algebra
- University of Basel: Assistant Professor of Applied and Computational Mathematics
- Universität Bern: Assistenzprofessur (tenure track) "Mathematik für Anwenderinnen und Anwender"
- University Hospital Basel: Open position in biostatistics (PhD student, 3 years)

Permanent Math Job Pages in Switzerland

- University of Basel
- University of Fribourg
- University of Genève
- ETH Zürich
- Seminar Angewandte Mathematik, ETHZ
- Institute for Operations Research, ETHZ
- University of Zürich

General Math Job Pages

- Luchsinger's Job Pages: Switzerland, worldwide
- Career.edu
- Euro-Math-Job
- Stellenbörse Mathematik

Mathematicians and Statisticians

… and their way to professional independence:

- an essay of Dr. C.J. Luchsinger.

Grants

- Swiss National Science Foundation
- European Grants
  - General FP7
  - CORDIS FP7
  - CORDIS FP7 Ideas
  - ERC Starting Independent Research Grant (pdf)
  - Find a call (there, click on *Ideas: 2006-12-22: ERC-2007-StG*